

ABSTRACT

A vehicle engine has a system of valves that permits various engine cylinders to operate in different modes of operation. During braking, some of the engine cylinders receive atmospheric air, compress it, and transfer it to an intermediate air-container. Other cylinders receive compressed air from the intermediate air-container, further compress it, and transfer it to a high-pressure air-reservoir for storage. During acceleration, some of the engine cylinders receive compressed air from the high-pressure air-reservoir, expand it to a lower level of pressure, and transfer it to the intermediate air-container. Other cylinders receive air from the intermediate air-container, further expand it, and use it for combustion in an internal-combustion cycle. During short stops, the engine is shut down, for the duration of the stop, and, then, it is restarted with compressed air. During cruise, the engine operates as a conventional internal-combustion engine.